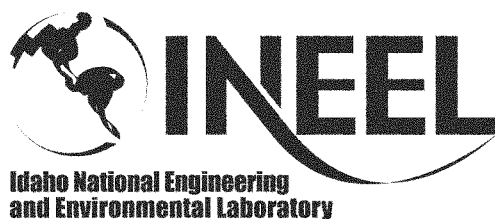


Plan

INTEC Spent Nuclear Fuel Management Plan

Prepared for:
U.S. Department of Energy
Idaho Operations Office
Idaho Falls, Idaho




Form 412.14
04/03/2003
Rev. 04

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Clean/Close INTEC Project	Plan	For Additional Info: http://EDMS	Effective Date: 10/06/03
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Change Number: 103401

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SUMMARY

The Idaho National Engineering and Environmental Laboratory (INEEL) is responsible for the disposition of approximately 257 metric tons heavy metal (MTHM) of spent nuclear fuel (SNF). The SNF is either currently stored at the INEEL or at the Fort St. Vrain Independent Spent Fuel Storage Installation near Platteville, Colorado, or will be shipped to the INEEL from domestic and foreign locations. Approximately 255 different types of SNF are in the inventory to be dispositioned.

This SNF management plan addresses the following objectives:

- Reduction of the vulnerabilities associated with existing fuel storage facilities identified by the Spent Fuel Working Group dated December 7, 1993
- Movement of SNF from wet to dry interim storage
- Consolidation of SNF according to the programmatic Environmental Impact Statement/Record of Decision
- Receipt of SNF from foreign and domestic sources
- Preparation of SNF for shipment to the repository.

In achieving these objectives, this SNF management plan identifies goals and objectives, strategies, requirements, assumptions, control measures, interfaces, and functions to remove SNF from eight onsite storage locations and numerous offsite locations. High-level schedules are defined in order to meet Settlement Agreement milestones and to develop lower-level schedules at the subproject level. The high-level schedules are integrated with other U.S. Department of Energy sites and the repository and other INEEL activities to reduce costs and increase efficiency in the disposition of SNF to the repository.

The SNF related activities are governed by regulatory and legal requirements, repository requirements, and U.S. Department of Energy requirements and guidance, which are implemented via life-cycle baseline and detailed work plans. Baselines are established in order to measure performance and track changes. Quality assurance requirements are integrated into the activities defined within each project to enable successful mission completion.

The goal for this SNF management plan as it relates to the development of project execution plans includes identifying the following information:

- Scope, assumptions and requirements
- Work breakdown structures
- Organizational structures

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- Internal and external participants
- Interfaces
- Schedules
- Controls.

Quality assurance requirements have been established via PLN-533 for non-Nuclear Regulatory Commission-licensed facilities and PLN-466 for Nuclear Regulatory Commission-licensed facilities. These quality assurance requirements are applicable to the SNF projects and activities and are driven by DOE/RW-0333P, *Quality Assurance Requirements and Description*.

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ACRONYMS

ACWP	actual cost of work performed
AFRRI	Armed Forces Radiobiology Research Institute
ANL-E or W	Argonne National Laboratory-East or West
ANSI	American National Standards Institute
ASME	American Society Mechanical Engineers
ATR	Advanced Test Reactor
B&W	Babcock & Wilcox
BBWI	Bechtel BWXT Idaho, LLC
BCWP	budgeted cost of work performed
BCWS	budgeted cost of work scheduled
CFR	Code of Federal Regulations
CPP	Chemical Processing Plant (now INTEC)
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DOE-EH	Department of Energy, Office of Environment, Safety and Health
DOE-EM	Department of Energy, Office of Environmental Management
DOE-HQ	Department of Energy, Headquarters
DOE-NE	Department of Energy, Office of Nuclear Energy
DOE-SR	Department of Energy, Savannah River Operations Office
DRR	domestic research reactor
DWP	detailed work plan
EBR-II	Experimental Breeder Reactor II
ECF	Expended Core Facility
EIS	environmental impact statement
EM	Environmental Management
EPRI	Electric Power Research Institute
ES&H	environment, safety and health
FECF	Fuel Element Cutting Facility
FRR	foreign research reactor
FY	fiscal year
GDE	guide
GM	General Manager
GPU	General Public Utilities
HLW	high-level waste
HVAC	heating, ventilating, and air conditioning
ICP	Idaho Completion Project
IFSF	Irradiated Fuel Storage Facility (CPP-603 IFSF)
INEEL	Idaho National Engineering and Environmental Laboratory (formerly INEL)
INTEC	Idaho Nuclear Technology and Engineering Center (formerly ICPP)

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ISFSI	Independent Spent Fuel Storage Installation
ISMS	Integrated Safety Management System
LANL	Los Alamos National Laboratory
LCB	life-cycle baseline
LICP	Line-Item Capital Project
LOFT	Loss-of-Fluid Test
LWBR	light water breeder reactor
M&O	Management and Operating (contractor)
MCP	management control procedure
MOA	memorandum of agreement
MTHM	Metric Tons Heavy Metal
MTR	Materials Test Reactor
NE-ID	Department of Energy, Idaho Operations Office
NFS	Nuclear Fuel Services
NQA	Nuclear Quality Assurance Committee
NRC	Nuclear Regulatory Commission
NSNFP	National Spent Nuclear Fuel Program
OCRWM	Office of Civilian Radioactive Waste Management
PBF	Power Burst Facility
PBI	Performance Based Incentive
PDD	Program Description Document
PEP	Project Execution Plan
PLN	Plan
PM	Project Manager
PRD	Program Requirements Document
QA	quality assurance
Q-List	quality level list
ROD	record of decision
RW	Radioactive Waste
SNF	spent nuclear fuel
SNFDSP	Spent Nuclear Fuel Dry Storage Project
SP	Subproject
SRS	Savannah River Site
SSC	systems, structures and components
STD	Standard
TAN	Test Area North
TMI-2	Three Mile Island Unit 2
TPR	Technical Procedure
TRA	Test Reactor Area

**INTEC SPENT NUCLEAR FUEL MANAGEMENT
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Page: 9 of 50**USGS** United States Geological Survey**VP** Vice President**WAC** Waste Acceptance Criteria**WASRD** Waste Acceptance System Requirements Document**WBS** work breakdown structure**WFO** Work For Others

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1. SPENT NUCLEAR FUEL STRATEGY

This SNF management plan describes the Idaho National Engineering and Environmental Laboratory (INEEL) spent nuclear fuel (SNF) management strategy at the INEEL. The INEEL SNF management plan integrates the SNF work scope provided in the Bechtel BWXT Idaho, LLC (BBWI) contract with the U.S. Department of Energy Idaho Operations Office (NE-ID), the Office of Civilian Radioactive Waste Management (OCRWM) repository planning, regulatory SNF drivers, and BBWI Corporate requirements. The INEEL SNF management plan also incorporates evolving programmatic U.S. Department of Energy (DOE) direction from initiatives, such as the Accelerating Cleanup Plan and the National Spent Nuclear Fuel Program (NSNFP), into a cohesive effort. This management plan describes the principal program objectives, essential elements of project management, and the set of management controls that will be met for managing INEEL SNF.

The INEEL SNF management activities address the following major objectives:

- Resolving existing SNF storage vulnerabilities
- Consolidating SNF into dry storage facilities to the extent feasible
- Managing the receipt and shipment of domestic and foreign SNF according to the terms of the DOE Environmental Impact Statement (EIS) Records of Decision (ROD) (see Section 1.1.2)
- Preparing SNF for repository emplacement.

1.1 Background

The INEEL has built much of its history on nuclear operations—much of it groundbreaking research with prototype research reactors. The federal government built many of the INEEL facilities before 1960; most were one-of-a-kind experimental facilities that allowed controlled research and challenged the accepted limits of nuclear physics, chemistry, and science at that time. Spent nuclear fuel from these reactors and elsewhere in the world was identified for reprocessing at the Idaho Chemical Processing Plant.

Ground was broken in 1950 for the Idaho Chemical Processing Plant (CPP), now known as the Idaho Nuclear Technology and Engineering Center (INTEC), for the purpose of reprocessing SNF to recover nuclear materials. In 1953, the first reprocessing campaign was initiated successfully. From 1953 to 1992, reprocessing campaigns for many different types, sizes, and compositions of SNF were conducted at INTEC. Each different fuel type required specific processing steps and recovery techniques. To accomplish the reprocessing, a multi-fuels reprocessing capability, using numerous dissolution headends that were tied to a single extraction process, was developed.

Several interim storage facilities that used underwater and dry storage technologies were constructed at INTEC for the various SNF types that were sent to INTEC for reprocessing.

In 1992, DOE announced it would no longer reprocess SNF to recover enriched uranium for reuse. In June 1993, DOE was ordered by the State of Idaho (Civil No. 91-0035-S-HLR) to prepare an EIS in consultation with the State of Idaho. The *Programmatic SNF Management and INEEL Environmental Restoration and Waste Management Programs Environmental Impact Statement*, DOE/EIS-0203-F, was issued in April 1995. In December 1993, a United States District Court Order placed an injunction against

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further shipments of SNF to the INEEL until DOE issued a ROD based on the EIS. The ROD (60 FR 28680) was issued in June 1995.

In October 1995, a Settlement Agreement between the State of Idaho, DOE, and the United States Navy was issued to identify enforceable milestones for removal of SNF from the State of Idaho. Included in the Idaho Settlement Agreement are annual restrictions on the amount of SNF received at the INEEL. Also, penalties for missed milestones could effectively halt shipments to the INEEL. A revised ROD was issued in March 1996 that reflects the terms and conditions of the Settlement Agreement. The Settlement Agreement includes monetary damages if the final milestone is missed.

The Idaho Settlement Agreement:

- Limits amount of SNF coming to Idaho
- Prohibits commercial SNF from coming to Idaho before a permanent repository is open
- Requires vulnerabilities to be resolved
- Identifies interim milestones to measure progress
- Sets deadlines for when SNF has to be out of Idaho.

The INEEL SNF Program Office was formed in 1994 to recommend and implement strategies, technologies, and processes to treat, condition, certify, and dispose of SNF for compliance with the Settlement Agreement, Consent Order, and other regulatory requirements. In 2002, the *Environmental Management Performance Management Plan for Accelerating Cleanup of the Idaho National Engineering and Environmental Laboratory* was issued by NE-ID. It included strategic initiatives to accelerate consolidation of spent nuclear fuel to INTEC. To address this and other strategic initiatives, the site contractor reorganized the INEEL cleanup related work under the *Idaho Completion Project*, with spent nuclear fuel related activities assigned to the *Clean/Close INTEC* project. Within the *Clean/Close INTEC* project are several subprojects associated with scope that previously was under the INEEL SNF Program Office. These include the: 1) SP-0, *INTEC Facility Authority and Project Support*; 2) SP-1, *SNF Consolidation*; and 3) SP-3, *Spent Nuclear Fuel & Calcine Disposition* subprojects. Collectively, the scope of these subprojects will be referred to as the SNF Management Program within this document.

Success of the SNF Management Program is measured in terms of milestone achievements, SNF dispositioned, safety, life-cycle costs, and regulatory compliance. Individual activities are coordinated and integrated to meet overall SNF Management Program objectives.

1.1.1 Current INEEL Spent Nuclear Fuel Environment

In addition to the SNF already onsite, DOE identified the INEEL site as the temporary storage location for DOE-owned non-aluminum-based SNF stored at DOE, domestic, and foreign locations. SNF at West Valley and Fort St. Vrain are subject to agreements between DOE and the States of New York and Colorado respectively, with interim disposition at the INEEL. In addition, the INEEL is expected to receive SNF from 16 domestic universities, 8 domestic reactor facilities, up to 18 foreign countries, and 5 DOE facilities. The INEEL will transfer Experimental Breeder Reactor II (EBR-II) sodium bonded SNF to Argonne National Laboratory West (ANL-W) for treatment.

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The responsibility for managing and operating the Fort St. Vrain Independent Spent Fuel Storage Installation (ISFSI) near Platteville, Colorado, was assigned to the INEEL SNF Program in 1997. The facility became the first DOE facility to be licensed by the Nuclear Regulatory Commission (NRC) (see Contract Number DE-AC07-96ID13425, *Settlement Agreement Modifying Contract DE-SC07-79ID01370, As Amended*, between DOE and the Public Service of Colorado).

The Public Service Company of Colorado Agreement:

- Requires DOE to assume title to the SNF stored in the ISFSI and assume responsibility for payments to the Nuclear Waste Fund—Complete
- Requires DOE to make the best efforts to transfer the NRC operating license for the Fort St. Vrain Dry Storage Facility from the Public Service of Colorado—Complete
- Requires DOE to operate the Colorado facility upon license transfer—In Progress
- Requires SNF to be out of Colorado by January 1, 2035—Planned
- Requires DOE to decontaminate and decommission Fort St. Vrain ISFSI—Planned.

PLN-845, *INEEL Spent Nuclear Fuel Integrated Transfer Schedule*, identifies the planned fuel transfers for the INEEL over the SNF Management Program life cycle. However, facility/equipment/manpower resource constraints need to be factored into the schedules. Planning has been accomplished on a gross-load basis only. Detailed planning may identify facility/equipment/manpower resource constraints that may require modification to the schedule developed. These modifications may require that the planning horizon for certain SNF receipts and transfers be adjusted.

Funding for the SNF Management Program is dependent on numerous factors such as the final INEEL funding appropriation levels, the overall Idaho Completion Project (ICP) and Clean/Close INTEC Project priorities, and individual SNF Management Program subproject priorities. The schedule is revised at least annually to incorporate changes such as completed work, new programmatic direction, established near-term funding levels, and improved knowledge based on detailed scheduling and resource loading activities.

1.1.2 Additional INEEL Spent Nuclear Fuel Drivers

The EIS/ROD discussed in previous sections plus additional EIS/RODs and environmental assessments important to the INEEL SNF mission are identified below:

- NE-ID, 1995, *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs*, DOE/EIS-0203-F, Idaho Operations Office, Idaho Falls, Idaho, April 1995.
- 60 FR 28680, 1995, *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs*, U.S. Department of Energy, Federal Register Notice, June 1, 1995, p. 28680.

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- DOE-SR, 1995, *Interim Management of Nuclear Materials*, DOE/EIS-0220, Savannah River Site, Aiken, South Carolina, October 1995.
- 60 FR 65300, 1995, *Interim Management of Nuclear Materials*, U.S. Department of Energy, Federal Register Notice, December 12, 1995, p. 65300.
- DOE, 1996, *Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel*, DOE/EIS-0218F, Washington, DC, February 1996.
- 61 FR 9441, 1996, *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs*, U.S. Department of Energy, Federal Register Notice, March 8, 1996, p. 9441.
- DOE, 1996, *Test Area North Pool Stabilization Project*, DOE/EA-1050, May 1996.
- 61 FR 25092, 1996, *Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel*, U.S. Department of Energy, Federal Register Notice, May 13, 1996, p. 25092.
- U.S. Navy, 1996, *Final Environmental Impact Statement for a Container System for Management of Naval Spent Nuclear Fuel*, DOE/EIS-0251, U.S. Department of the Navy, November 1996.
- 62 FR 1095, 1997, *Container System for the Management of Naval Spent Nuclear Fuel*, U.S. Department of the Navy, Federal Register Notice, January 8, 1997, p. 1095.
- NRC, 1998, *Construction and Operation of an Independent Spent Fuel Storage Installation to Store the Three Mile Island Unit 2 Spent Fuel at the Idaho National Engineering and Environmental Laboratory*, NUREG-1626, March 1998.
- DOE, 1999, *for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, DOE/EIS-0250D, July 1999.
- DOE, 1999, *Supplement Analysis for a Container System for the Management of DOE Spent Nuclear Fuel Located at the INEEL*, DOE/ID-10636, Idaho Operations Office, Idaho Falls, Idaho, March 1999.
- 64 FR 23825, 1999, *Record of Decision for a Multi-Purpose Canister or Comparable System for Idaho National Engineering and Environmental Laboratory Spent Nuclear Fuel*, Office of the Assistant Secretary for Environmental Management, Washington, DC, Federal Register Notice, May 4, 1999, p. 23825.
- DOE, 2000, *Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*, DOE/EIS-0306, July 2000.
- 65 FR 56565, 2000, *Record of Decision for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*, Federal Register Notice, September 19, 2000, p. 56565.

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- DOE, 2002, *Final Environmental Impact Statement (EIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*, February 2002.
- DOE 2002A, *Environmental Management Performance Management Plan for Accelerating Cleanup of the Idaho National Engineering and Environmental Laboratory*, DOE/ID-11006, July 2002.

1.2 Mission Statement

The mission of the SNF Management Program is to complete spent nuclear fuel removal from Idaho according to the terms and conditions of the Idaho Settlement Agreement, Accelerating Cleanup Performance Management Plan, and other drivers.

The vision of the SNF Management Program is to accomplish the mission safely, securely, timely, and cost effectively.

The planning assumptions for the SNF Management Program are as follows:

- NE-ID is the main customer for SNF Management Program
- EM funding remains flat for cleanup
- The national repository will be completed and ready to receive SNF from the INEEL by FY 2010
- SNF will be transferred to the INEEL according to the Programmatic EIS/ROD
- The INEEL will transfer EBR-II SNF to ANL-W
- Foreign research reactor (FRR) SNF will be shipped to the INEEL through FY 2009
- Domestic research reactor (DRR) SNF will be shipped to the INEEL through FY 2027.

The goals of the SNF Management Program are to support the overall DOE SNF mission by:

- Effectively planning work and working the plans as defined in higher-level documents
- Assuming responsibility as NE-ID's lead in conditioning, and packaging of SNF for repository disposition
- Supporting the INEEL mission as lead nuclear energy research facility as it relates to SNF safe storage.

The objectives of the SNF Management Program are to support the overall DOE SNF mission by:

- Resolving existing SNF storage vulnerabilities
- Consolidating SNF into interim dry storage

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- Managing the receipt and shipment of domestic and foreign SNF according to the terms of the DOE ROD
- Preparing SNF for shipment to the repository.

The primary functions of the SNF Management Program are:

- Managing and operating SNF facilities and related resources in a safe, secure, cost-effective, and compliant manner
- Developing and maintaining a baseline for work scope cost and schedule to control aspects of SNF Management Program activities
- Developing and maintaining a set of management implementation plans and procedures for effective risk management
- Modifying facilities to provide improved capabilities or resolve vulnerabilities
- Supporting the NE-ID Spent Nuclear Fuel Dry Storage Project (SNFDSP) activities
- Establishing and monitoring priorities for project support performed by internal suppliers and facilities
- Establishing and maintaining the liaison between internal and external customers
- Monitoring and reporting of program performance
- Providing safe, secure, cost-effective, and compliant interim storage of SNF at the INEEL and Fort St. Vrain until shipped to the repository
- Maintaining the interface with the NSNFP and OCRWM related to SNF disposition requirements.

1.2.1 INEEL Spent Nuclear Fuel Strategy

To address the stated mission, the SNF Management Program provides integrated program management, project management, project engineering, and systems engineering to support SNF projects.

To improve the possibility of acceptance of the INEEL DOE-owned SNF at the repository, the DOE has directed that new SNF facilities be licensed by the NRC. Two INEEL facilities (CPP-1774 and Fort St. Vrain) currently maintain NRC licenses. The SNFDSP will also be NRC-licensed by the primary contractor. An NRC licensed facility is believed to increase the likelihood that the SNF will be stored on-site in a manner acceptable for disposal at the repository.

Integration with the DOE repository program is an important strategy for acceptance at the earliest possible time of the INEEL SNF. This is achieved by support of the NSNFP. The NSNFP provides DOE complex-wide implementation of the repository program. In addition, the NSNFP performs assessments of the repository quality assurance (QA) program and implementation of the OCRWM program requirements through development of performance-based acceptance criteria for the DOE-owned SNF.

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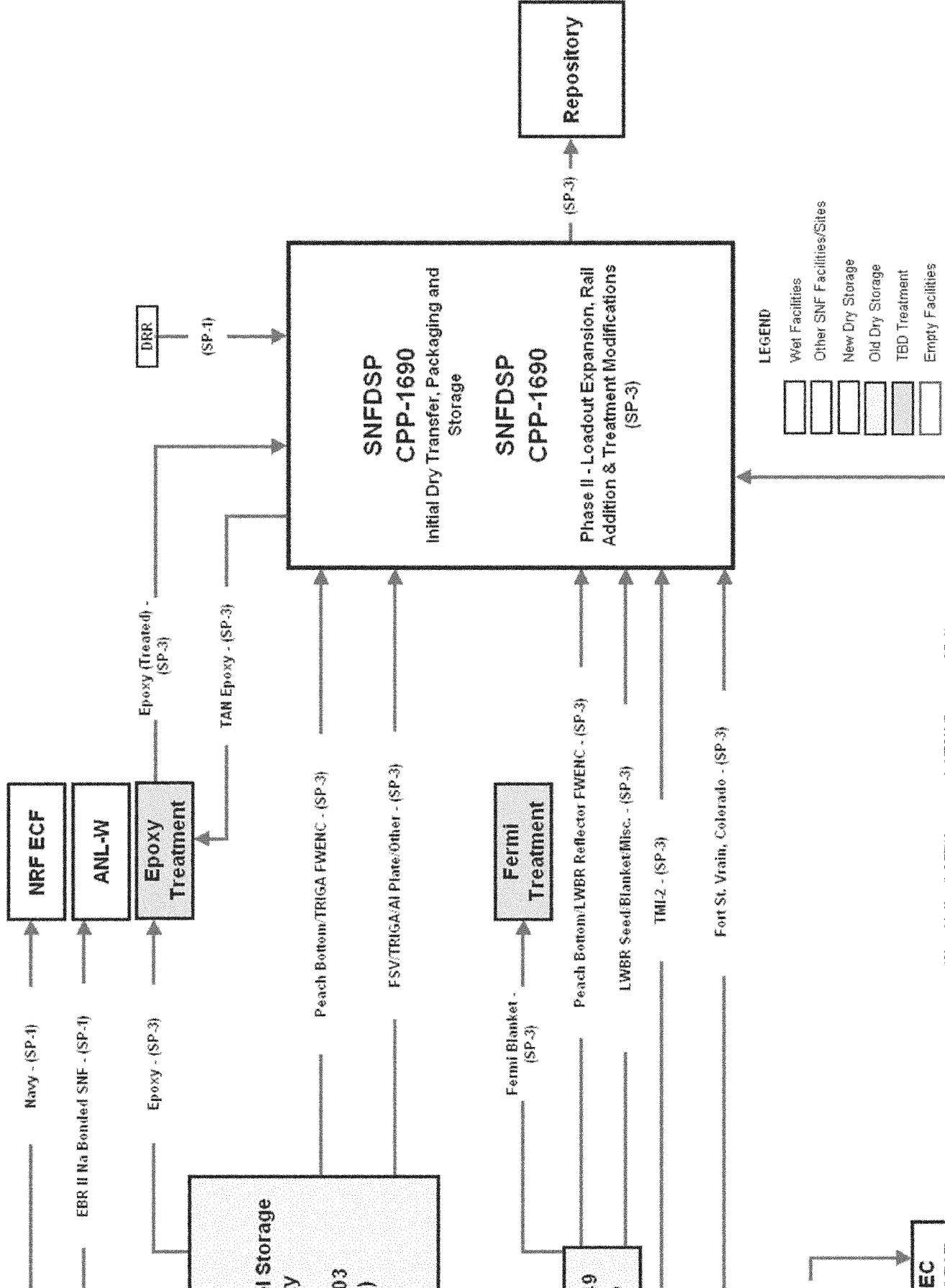
Technology development plays a vital role in providing safe interim storage and identification of technologies required to condition, characterize, and package SNF for meeting repository acceptance criteria.

An additional key strategy is development, implementation, and maintenance of a QA Program compliant with DOE/RW-0333P to support repository acceptance of INEEL SNF. This QA Program will provide the basis for oversight of the receipts, consolidation, and storage requirements as the INEEL transitions to dry storage. Independent oversight of QA Program functions by the NRC and NSNFP QA staff is required to maintain the NRC licenses for the new dry storage systems.

Construction and operation of the SNFDSP facility is another key factor in meeting the Settlement Agreement milestones as this facility supports removal of SNF from wet to dry storage and provides the mechanics for shipment of the SNF to the repository. A NE-ID contract has been awarded to Foster Wheeler to design, construct, and operate this facility just outside the boundaries of INTEC. Operations are expected to begin in December 2005. This facility will perform functions to prepare the INEEL SNF for acceptance at the repository, including conditioning (if required), characterization (if required), and packaging.

For information, Figure 1 illustrates the SNF Management Program fuel/facility flow (Revision 8) identifying facilities, facility interfaces, and fuel flows of SNF. This process flow represents the strategic fuel movement plan for the SNF Management Program and is used as the basis for the SNF Management Program detailed work plans (DWPs) and the life-cycle baseline (LCB).

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1.3 Program Organization, Responsibilities, and Authorities

The BBWI organization structure from the top level of the company to the SNF Management Program is depicted in Figure 2.

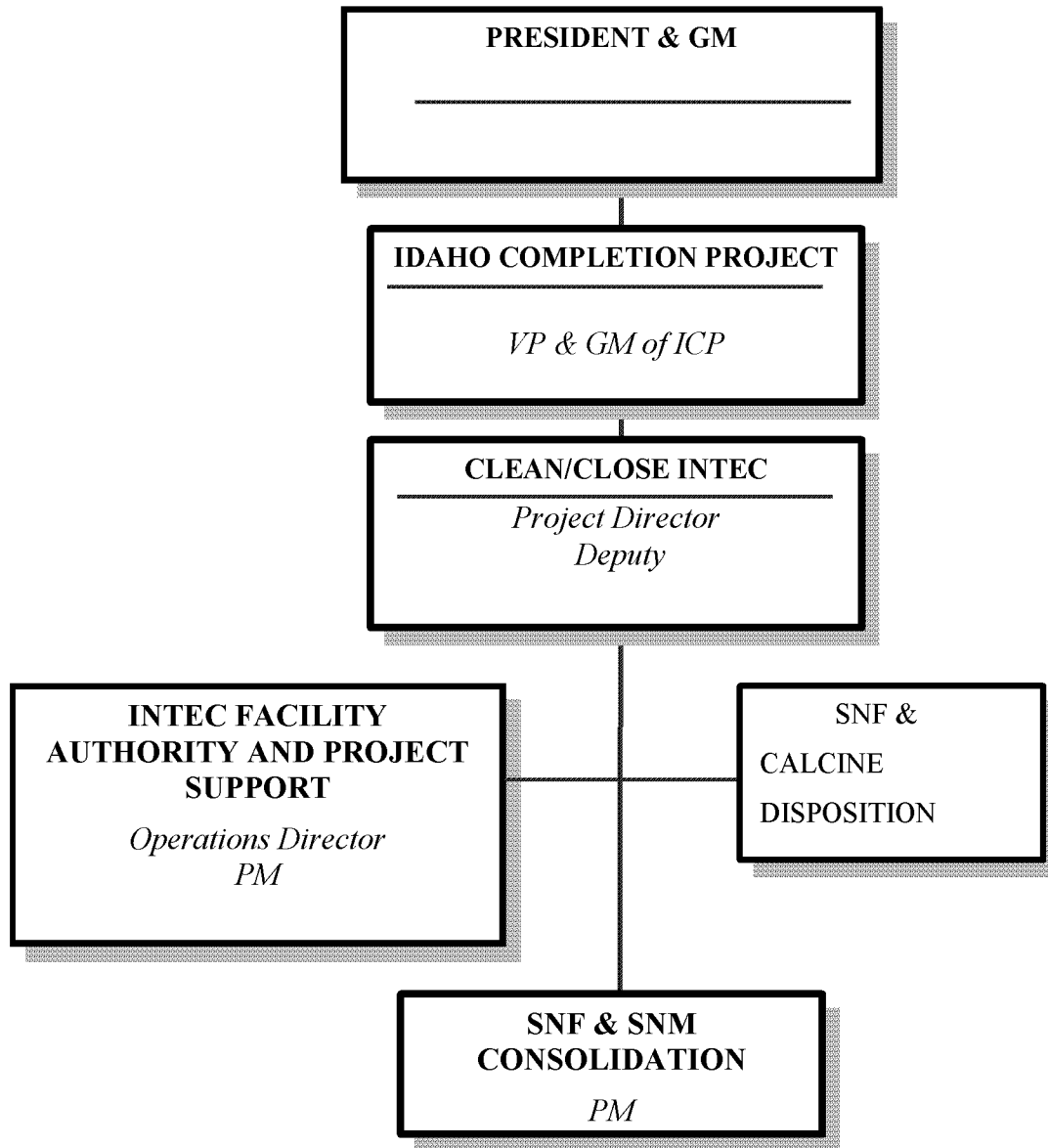


Figure 2. SNF Management Program organization as of September 25, 2003.

**INTEC SPENT NUCLEAR FUEL MANAGEMENT
PLAN****Identifier:** PLN-642
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Page: 19 of 50**1.3.1 SNF Management Program Roles, Responsibilities, Accountabilities, and Authorities**

As part of the Integrated Safety Management System (ISMS), Voluntary Protection Program, and the Standards Based Management System structure, the company has developed clear lines of responsibility and authority from management to the employee. Roles, responsibilities, accountabilities, and authorities are described in ICP-PDD-1005, *ICP Line Management and Operations Manual*, and are not repeated here. Specific scope for subproject managers is identified in detailed work planning documents.

1.4 Program Participants

Program participants include the States of Idaho, Colorado, New York, and Tennessee; the Navy; domestic and foreign reactor research facilities; the Nuclear Regulatory Commission (both as customer and regulator), the NSNFP, other INEEL organizations, and various stakeholders.

The NSNFP provides waste acceptance criteria, SNF repository licensing criteria, characterization requirements, standard canister conceptual design, and transportation interfaces to the SNF Management Program. In addition, the NSNFP identifies complex-wide technologies for treatment and interim and final storage.

The SNF Management Program provides storage to the Navy for SNF in CPP-666. In addition, SNF from the Advanced Test Reactor (ATR) is stored in CPP-666 because of limited space at ATR.

In the following subsections each of the program participants are identified. Additional information may be found in Appendix A, Existing and Future SNF Activities, as well as project execution plans and other organizational plans.

1.4.1 Domestic SNF Participants

There are approximately 27 sites within the United States that have SNF that needs to be shipped to the INEEL, stored in interim INEEL facilities and packaged for repository shipment. (Note: Fort St. Vrain SNF will not be stored at the INEEL, only packaged and shipped to the repository.) These sites are referred to as “domestic” sites and consist of various universities, DOE sites, and other sites currently storing DOE-owned SNF.

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Receipts from Domestic Sites

The domestic sites currently identified to ship SNF to the INEEL are shown in Table 1.

Table 1. Domestic SNF for receipt at INEEL.

University Receipts			
Cornell University	Kansas State University	North Carolina St. Univ.	Oregon State University
Penn State University	Reed College	University of Buffalo, State University of NY	University of Texas A&M
University of Arizona	UC Irvine	University of Illinois	University of Maryland
University of Texas	University of Utah	University of Wisconsin	Washington State Univ.
DOE Receipts			
ANL-E	Oak Ridge	Sandia National Laboratory	Hanford (to ANL-W)
Miscellaneous Receipts			
Aerotest San Ramon, CA	AFRRI Bethesda, MD	B&W Lynchburg, VA	DOW Midland, MI
General Atomics, San Diego	McClellan AFB (now operated by UC Davis)	USGS, Denver, CO	
Special Receipts (packaging and repository shipment only)			
Fort St. Vrain			

Receipts from Oak Ridge—Current Project Description

The Oak Ridge site received a number of SNF assemblies and many samples of fuel over the normal course of operations for several decades. Among these are graphite Peach Bottom Unit 1 assemblies and other miscellaneous samples of fuel that have accumulated at the Oak Ridge site for testing and analysis. Oak Ridge is currently repackaging the samples and pieces into canisters for shipment to the INEEL for interim storage and eventual disposition to the repository. The shipments are scheduled for FY 2003 and 2004.

Shipments to Domestic Sites

The INEEL is currently storing SNF (EBR-II/Fermi Blanket) that will be transferred to ANL-W. SNF will also be returned to the Navy by shipping it to NRF ECF.

1.4.2 Foreign SNF Participants

There are approximately 17 countries that have nuclear reactors using nuclear fuel received from the United States under the Atoms for Peace Program of the 1950s. In return for the nuclear fuel these countries agreed to forego development of nuclear weapons (see Section 1.1.2 for the FRR EIS/ROD references). Countries that chose to participate have the opportunity to ship their SNF back to the United States between 1997 and 2009. These sites are referred to as FRR countries and are participating in the

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return of SNF to the United States in support of nonproliferation efforts under an Agreement between the Department of State and DOE. The policy stated that developed countries would reimburse the DOE at a fixed dollar rate per MTHM shipped to the United States. Nondeveloped countries would ship at no cost.

FRR countries that could participate in the return of SNF to the INEEL are listed in Table 2.

FRR receipts require coordination with the foreign countries and their governments, the DOE and Department of State, the U.S. Coast Guard, other DOE sites, local U.S. cities, counties, other local government agencies and stakeholders along the shipping route, and DOE transportation contractors.

Table 2. Potential FRR receipt countries.

Receipts from Foreign Research Reactor Countries			
Austria	Indonesia	Philippines	Turkey
Bangladesh	Italy	Romania	Zaire (Congo)
Brazil	Japan	Slovenia	
Finland	Malaysia	Taiwan	
Germany	Mexico	Thailand	

1.4.3 Other Project Participants

In addition to the domestic and foreign spent nuclear fuel participants, the following internal and external organizations are participants in the SNF Management Program either directly or indirectly. The organization and their roles are defined below.

The **NRC** regulates NRC licensed DOE spent nuclear fuel storage facilities.

The **NSNFP** defines and supports resolution of associated issues for characterization, safe interim storage, and final disposition of DOE SNF. Activities include maintenance of the SNF database, repository analysis specific to inclusion of DOE SNF in the repository, materials engineering support and other technology issues related to characterization, safe storage, packaging and final disposition of SNF.

Foster-Wheeler, the contractor for the SNF repository packaging and dry storage facility, is a participant as its operations come online in late FY 2005. Coordination of fuel shipments from INEEL facilities to SNFDSP facilities is an existing activity within the SNF Management Program.

The **Naval Nuclear Propulsion Program**, a joint DOE/United States Navy program is a participant with storage of Navy SNF at CPP-666. The Navy will continue to play an important role at the INEEL for years to come, and additional studies and support are expected. The Navy is also a party to the Settlement Agreement with the State of Idaho.

Other cask work and fuel examination work has been done for the Navy by the INEEL. The Work for Others Program manages efforts and specialized functions for the Naval Nuclear Propulsion Program.

The **OCRWM** is a participant with regard to repository transportation and storage requirements. The SNF Management Program, through interaction with the NSNFP, formally reviews the Waste Acceptance System Requirements Document (WASRD) and establishes plans to meet these requirements.

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In addition, a memorandum of agreement has been signed for acceptance of DOE SNF by DOE-EM and OCRWM.

ANL-W and ANL-East (ANL-E) are participants for treatment of sodium-bonded SNF and special examination of spent nuclear fuel. Plans currently identify the CPP-749 Fermi Blanket SNF for shipment to ANL-W for treatment. In addition, ANL-W has 4.7 MTHM SNF to be sent to INTEC (currently defined for transfer in the 2006 to 2008 timeframe).

The **Public Service of Colorado** and the **State of Colorado** are participants in the SNF Management Program via the agreements associated with the Fort St. Vrain ISFSI.

Idaho Department of Environmental Quality issues permits for work and oversees the State of Idaho environmental requirements and compliance at the INEEL site.

The **U.S. Department of Transportation** and the **NRC** regulate offsite transportation activities.

1.5 Technology Needs

To carry out the SNF Management Program mission, the INEEL recognized that an integrated approach to technology development was needed. The *INEEL Spent Nuclear Fuel Technology Development and Deployment Plan*, PLN-841, establishes a common and consistent technical basis for technology development, integrates opportunities with DOE complex-wide efforts, and proposes development of timely, cost-effective technical solutions for INEEL SNF management. The plan is based on previous reports and studies that (a) identified the SNF technology development needs, (b) identified the associated cost and schedules, and (c) prioritized the technology development needs for the complex. The Technology Deployment Plan integrates the complex-wide efforts into the INEEL requirements.

The INEEL SNF Technology Development and Deployment Plan describes:

- Technologies needed to resolve existing SNF storage issues and environmental, safety, and health vulnerabilities and guidelines for SNF characterization
- Technologies for SNF transportation, interim storage, and direct disposal
- New treatment technologies to prepare SNF for disposal.

Refer to PLN-841, *INEEL Spent Nuclear Fuel Technology Development and Deployment Plan*, for further details regarding technology issues.

1.6 Program Reporting

SNF Management Program progress reporting is performed at various reporting levels designed to meet the needs of the different levels of management reviewing the information. The SNF Management Program contributes to the following progress reviews and reports:

- **Clean/Close INTEC Project Monthly Progress Review**—Each Clean/Close INTEC Project subproject prepares a summary, which includes performance analysis graphs, variance statements, staffing forecasts, Performance Based Initiative (PBI) milestone status, and cost performance reports. This review is presented by subproject PMs to the Clean/Close INTEC Project Director.

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- **IPS Monthly Report** – The Project Management System IPS2000 Project Status Narrative report is provided monthly and includes a narrative report of the accomplishments and issues for control accounts within the Clean/Close INTEC Project.
- **ICP Monthly Review**—This report is presented in a meeting with NE-ID and covers activities, issues, cost performance, variances, and the status of performance objectives.
- **Daily Shift Summary Report**—INTEC shift managers issue this report daily. It covers accomplishments and issues for the prior 24-hour period and is generally issued by 7:00 am each working day (Monday to Thursday). The Monday report covers events from the previous Thursday to Monday.
- **SNF Receipt Forecast for the upcoming year and SNF Receipt Report** of actual receipts for the year past. These reports are required by the Idaho Settlement Agreement and are provided annually to the State of Idaho by NE-ID in December and January of each year.

1.7 Management Plan Revision Process

This plan will be updated annually in conjunction with the DWP/LCB update. The DWP signoff is scheduled for late September of each year with the Life-Cycle Plan update scheduled for completion by January 31.

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2. PROGRAM BASELINES

The SNF Management Program requirements and scope are derived from the DOE management and operations (M&O) contract. The Life Cycle Baseline identifies estimated costs for the life cycle, and Detailed Work Plans identify funding needs for the execution year goals and objectives for the SNF Management Program. The SNF Management Program baseline for the execution year is thus set. Changes to this baseline are controlled. The basic planning flow is depicted in Figure 3. It identifies the requirements in List A and List B, which are incorporated into the M&O contract. List A identifies national codes and standards. List B identifies the DOE and NE-ID internal requirements.

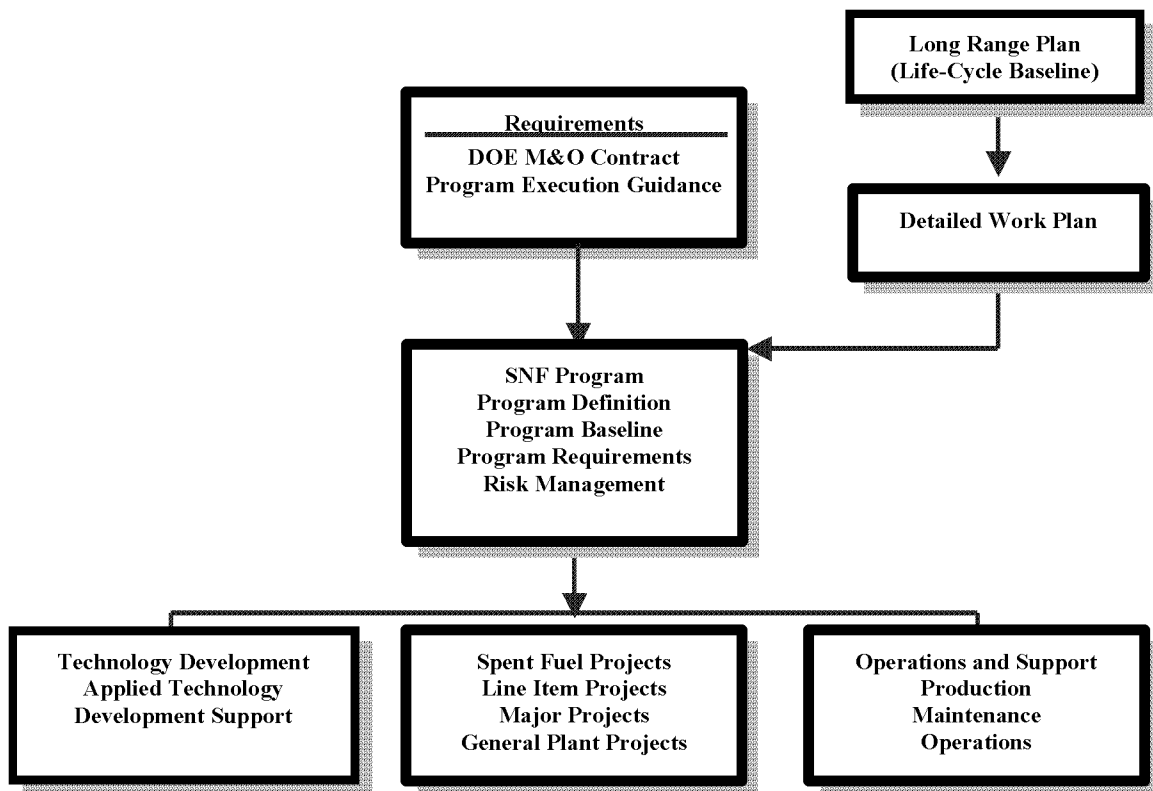


Figure 3. Spent Nuclear Fuel planning flow.

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2.1 Purpose and Scope

The program baseline for scope, cost, and schedule contained in this section has been developed to: (a) provide program definition for approval and authorization by DOE; (b) enable program objectives to be met; (c) establish performance metrics and measurement criteria; and (d) establish the processes for management, monitoring, and reporting of progress during program execution.

Activities related to repository requirements must be managed in accordance with DOE requirements. The following activities and associated repository requirements are to be specifically addressed in project execution plans and include:

- Activities that affect traceability of existing data to onsite containers
- Activities that affect fuel record retrieval
- Activities that create new SNF data
- Activities that confirm existing SNF data
- Activities that modify the fuel configuration (cutting long fuel assemblies to fit canisters, disassembling fuel assemblies, etc.)
- Activities related to items or components that control the fuel configuration during offsite shipment to the repository or repository handling
- Final dewatering or drying activities
- Activities related to the design, procurement, fabrication, or installation of criticality controls
- Activities related to the design, procurement, or fabrication of items important to safety on the repository Q-list to be turned over to or used by the repository
- Activities related to services provided to the repository
- Activities related to deployment of technologies.

Non-repository activities must meet DOE requirements as defined in DOE orders, regulations, codes and standards, and contractual clauses. The requirements are summarized and approved by the contractor in the attachment to the M&O contract and are identified as List A and List B.

2.1.1 Milestones and Critical SNF Activities and Decisions

The SNF Management Program will focus on the following key milestones associated with the State of Idaho Consent Order and Settlement Agreement:

- Empty CPP-603 South Basin—Completed April 28, 2000
- Complete Three Mile Island Unit 2 (TMI-2) fuel movement to dry storage facilities by 06/01/2001—Completed April 20, 2001

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- Commence movement of wet stored SNF to dry storage by July 1, 2003 – Completed with first transfer of ARMF/CFRMF SNF from TRA in 1997
- Complete removal of SNF from wet storage by December 31, 2023
- Remove SNF from the State of Idaho by January 1, 2035.

In addition, the following interim activities will be completed to support the management of SNF at the INEEL associated with existing vulnerabilities:

- Transfer of remaining onsite wet-stored SNF to dry storage, includes Loss of Fluid Test (LOFT)/Commercial SNF; Power Burst Facility (PBF) and Materials Test Reactor (MTR); and CPP-666 by September 30, 2012
- Movement of CPP-749 first generation SNF storage to second generation storage (if determined necessary)
- Receipt of foreign and domestic research SNF in dry storage at IFSF (continuing)
- Miscellaneous receipts and shipments of DOE-owned SNF to and from West Valley, and Oak Ridge.

The following key decision dates will determine future program direction:

- Commence negotiations between DOE and the State of Idaho for a schedule to remove wet-stored SNF to dry storage. The Settlement Agreement date is December 31, 1999. This item is complete according to NE-ID Memorandum to Dirk Kempthorne, Governor of the State of Idaho, dated May 17, 1999; commencement date was May 13, 1999.
- Availability of the repository for disposition of DOE-owned SNF. (Current INEEL assumption is that shipments from INEEL to the repository will begin in FY 2010 and end in FY 2029 with approximately 200 shipping cask loads.)

2.1.2 Work Scope Key Milestones

The following key milestones relate to the Consent Order and Settlement Agreement. These milestones, if not met, could result in halting shipments of SNF into the State of Idaho according to the terms of the Settlement Agreement.

- Removal of SNF from wet storage by December 31, 2023 (including Navy SNF)
- Completion of shipment of SNF from the State of Idaho by January 1, 2035.

While these milestones represent progress in the resolution of vulnerabilities and eventual movement of SNF out of the State of Idaho, management must be concerned with the efficient, safe, and effective implementation of the SNF Management Program. Performance goals to minimize costs, reduce schedules and perform work in a safe manner are as important to achieving success at the INEEL as achieving the legal milestones. Additional milestones can be found in the INTEC Completion LCB and INTEC Clean-Close Master Schedule Milestones chart.

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2.1.3 Key Assumptions

The LCB was updated in early FY 2003. The life-cycle planning basis included documented requirements and assumptions, work scope definition, schedule considerations, and cost estimates. Of particular importance to the life-cycle planning process were assumptions made concerning both programmatic and technical issues. The following assumptions are considered of particular importance to the successful completion of the SNF Management Program culminating in removal of all SNF from the State of Idaho by January 1, 2035.

- Funding will be available to meet the Settlement Agreement Milestones as currently negotiated.
- The repository will begin receiving INEEL SNF in 2010 and continue receiving INEEL SNF until completion.
- The SNFDSP facility is forecasted to be online and operational beginning in December 2005.
- Spent nuclear fuel and calcine will be disposed of separately, on separate schedules. Co-disposal is being considered.
- The EIS ROD will be modified to remove the transfer of aluminum clad SNF from the INEEL to the Savannah River Site, and the transfer of non-aluminum clad SNF from Savannah River to the INEEL. These SNF types will be sent directly to the repository from the sites where they are presently stored.
- EBR-II sodium-bonded SNF will be shipped to ANL-W for treatment and disposition.
- Fermi sodium-bonded SNF disposition alternatives are being reviewed. The LCB assumes that Fermi will be shipped and treated at ANL-W for cost estimate purposes. Environmental Management is responsible for treatment costs but none of the ANL-W hotel load.
- Additional lag storage (if required) will be funded and built as an addition to the SNFDSP.
- Fort St. Vrain SNF in Colorado will be shipped to the INEEL for repackaging into repository acceptable standard canisters then shipped to the repository .

These assumptions (and other assumptions may be located in the LCB document, Project Scope statements) will be confirmed as the program matures. Annual replanning will address unknowns and changes such as reductions in funding, carryover scope from previous years, and responsibilities for SNF not currently defined within the scope of the program.

2.1.4 Constraints

The funds for completion of the existing scope have, and will continue to have, a constraint that has resulted in delays in the overall program goals and objectives. At this point, none of these delays have resulted in overall program slippage or missed milestones.

SNF activities need to be assessed for impact to the OU 3-13 ROD's risk numbers as part of the VCO and CPP-603 basin activities.

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Page: 28 of 50**2.1.5 Specifically Excluded Work**

The SNF Management Program will prepare SNF for transportation. However, the repository program will be responsible for the transportation to the repository.

The SNF Management Program will not dispose of or treat the EBR II SNF. This fuel will be shipped to ANL-W for disposition by their programs (INTEC packaging and transportation facilities may be used for these shipments).

Decontamination and decommissioning (D&D) are the responsibility of another Clean/Close INTEC subproject (SP-6).

2.1.6 Alternatives

Value Engineering and Systems Engineering tools and techniques are used, as required, to establish alternatives for SNF activity decisions. Recommendations are provided to NE-ID after the alternative analyses are complete and the M&O has established a defensible position.

Alternatives will be evaluated based on factors to include ES&H, interim costs, schedule, technical considerations, ease of execution, and life-cycle costs. Other evaluation factors should be considered. SNF personnel, as selected by project management, knowledgeable of the activities and processes will be used to evaluate alternatives. Value Engineering sessions are a tool for determining alternatives and recommended approach. Identifying and evaluating alternative approaches to resolve issues is a key element in meeting the letter and spirit of NRC regulatory analysis policy (from NUREG/BR-0184, Regulatory Analysis Technical Evaluation Handbook). Developing a set of alternative approaches is done early in the analysis process to help maintain objectivity and develop efficient implementation conclusions.

2.2 Budget

The SNF Management Program subprojects develop a DWP every year based on the LCB, funding targets, and company objectives. The DWP baseline for the next fiscal year becomes the basis for the budget. The baseline change process handles changes to the approved funding level.

In addition to the DWP, the Master Schedule is used by the Clean/Close INTEC Project to depict the various aspects of the SNF Management Program for senior management. Included on the Master Schedule are the following items of interest:

- Broad overview of SNF Management Program strategy
- Periods from “time now” through program closeout (includes historical)
- Basic program strategy as outlined on Fuel/Facility flowsheet (see Figure 1)
- SNF Management Program milestone status (Idaho Settlement Agreement and Program milestones)
- Repository-ready status of DOE-owned SNF

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- Annual and cumulative funding levels.

2.2.1 Execution Year

The SNF Management Program budgets and monitors work performance on a fiscal year basis. The fiscal year is from October 1 to September 30 of the following year.

- Execution year will consist of a detailed schedule of activities, identified resource requirements, and pricing
- Execution year plus one and two years will include a less detailed schedule of activities, resource requirements, and pricing
- Budgets will be based on the President's budget, Office of Management and Budget targets, and the third year request for funding
- Prior year carryover work scope and funding will be included as planned
- Annual priority listing will be used to establish program budget priority.

2.2.2 Detailed Work Plan

The Planning and Controls function prepares the DWP guidance document and kicks off the process around late-May or early-June for the INEEL. The SNF Management Program (including NE-ID counterparts) follows the DWP guidance document in preparing the scope of work, assumptions, schedules and budget for the next DWP submittal. The DWP is supported by contents specified in the guidance document.

2.2.3 Life-Cycle Baseline Plan

A LCB schedule that depicts project milestones and the composite work scope is prepared each year. The LCB schedule is rolled up into the master LCB schedule for the Clean/Close INTEC Project. The LCB is the basis for the DWP process.

- LCB addresses work scope at the subproject level.
- LCB includes objective of each subproject, drivers, detailed work scope, project interfaces, assumptions on which cost estimates were based, and deliverables.
- LCB will be updated using configuration control and management processes.

2.3 Schedule

A resource-loaded schedule will be prepared each fiscal year to identify resources required (labor, subcontract, materials, and other costs). These schedules are prepared during the DWP/LCB process.

Execution year schedules will be resource loaded, leveled, reviewed, and approved. Scheduling will be accomplished with Primavera P3, and costs will be derived by Cobra. These tools are capable of maintaining an initial baseline with approved changes.

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2.3.1 Milestones

The Clean/Close INTEC Project maintains the Milestone Schedule that contains the Enforceable Milestones (E1) and other milestones associated with internal commitments to NE-ID. The Milestone Schedule is included in performance reports.

2.4 Work Breakdown Structure

The life-cycle WBS is a hierarchical depiction of the overall Clean/Close INTEC Project, with portions associated with SNF Management Program activities. The SNF Management Program WBS is in Figure 4.

2.5 Baselines and Baseline Change Control

The SNF Management Program baseline is updated during annual planning. The baseline represents the work scope to be accomplished during the execution year within the budget constraints identified by DOE and M&O management. As trends develop during the execution year, baseline change proposals may be required to adjust the baseline to these known deviations from the original plan. Work scope, costs, and schedules may be adjusted to account for the baseline change. Therefore, the current baseline is the beginning of the year baseline plus baseline change proposals that have been approved.

The current baseline is maintained in the DWP for work scope and requirements, in the Cobra system for costs, and in Primavera P3 for schedule.

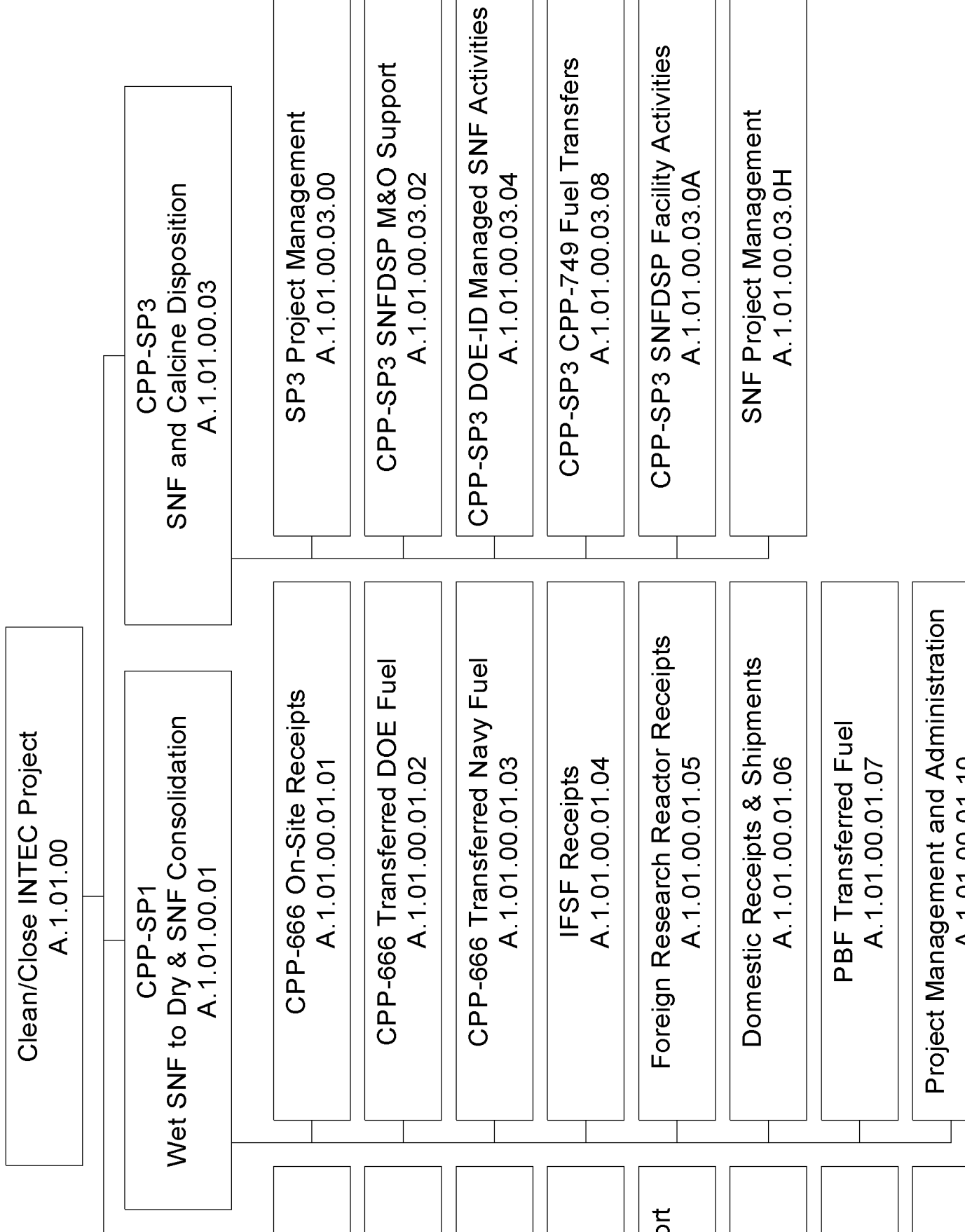
The Clean/Close INTEC Project has developed a Trend process that follows the trend procedure (MCP-3805, Trend Identification, Monitoring and Analysis Program) and the change control procedure (MCP-3416, Baseline Change Control).

Trends provide an early warning tool to project managers. The trend program is designed to alert the project team of potential or actual changes to scope, schedule, or estimate at completion.

There are two types of trends, scope and performance. Scope trends are items that are caused by influences external to the project, such as a suggestion by the customer, a recommendation by the company, or a requirement by regulatory agencies.

Performance trends are items that cannot be classified as scope trends, but are attributable to project evolution, such as pricing, quantity fluctuations, design changes, or productivity.

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3. PROGRAM REQUIREMENTS

Program requirements include the contract between NE-ID and the M&O contractor. These requirements are listed in the contract as List A and List B. List A is composed of laws, regulations, and industry codes and standards. PDD-1004, *INEEL Integrated Safety Management System*, identifies the flow of requirements with Integrated Safety Management.

Program drivers include those RODs identified in Section 1.1.2 of this document. NRC-licensed facilities adhere to NRC regulations in addition to requirements established by the M&O contract as outlined in PLN-466, *Quality Assurance Program Plan for NRC Licensed Facilities*.

The ISMS is integrated or built into the work at the INEEL as defined by company policies, standards, requirements and description documents, and procedures. Figure 3 of PDD-1004 identifies a top-down process for performing work and the associated requirements at each level. The framework for the ISMS is organized around the following five core functions: (1) define the work, (2) identify and analyze the hazards, (3) develop and implement controls, (4) perform the work, and (5) provide feedback for improvement.

In conjunction with the ISMS guiding principles, safety is built into the work at the INEEL at every step in the process. The guiding principles of ISMS are as follows:

1. Line management responsibility for safety
2. Clear roles and responsibilities
3. Competence commensurate with responsibilities
4. Balanced priorities
5. Identification of safety standards and requirements
6. Hazard controls tailored to work being performed
7. Operations authorization
8. Worker involvement.

3.1 Customers and Program Oversight Organizations

NE-ID is the primary customer for the SNF Management Program. The BBWI M&O contract with NE-ID identifies either directly or indirectly the requirements and work scope applicable to the program.

Oversight of the SNF Management Program is a primary function of the NE-ID Office and NE-ID Facility Representatives and Program personnel. The NE-ID Office has called on independent organizations to review INEEL SNF cost and schedule estimates. In addition, independent organizations have provided expertise to perform and develop life-cycle cost estimates (Army Corps of Engineers).

The State of Idaho Department of Environmental Quality oversees construction and other projects. The NRC oversees and regulates the licensed SNF facilities (Fort St. Vrain and CPP-1774 ISFSIs).

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The Defense Nuclear Facilities Safety Board, as commissioned by the United States Congress, oversees safety at INEEL nuclear facilities and has specifically provided recommendations to DOE concerning INEEL SNF safety.

Other program participants are identified in Section 1.4 of this document.

3.1.1 Customers

The primary SNF Management Program customer is NE-ID as formally defined in the contract between BBWI and NE-ID Contract Number DE-AC07-99ID13727.

Other customers that directly or indirectly influence the SNF Management Program include those mentioned in the previous section as well as acknowledged stakeholders, such as the Snake River Alliance and the Citizens Advisory Board. The primary vehicle for the formal interaction between the INEEL and the stakeholders is the EIS/ROD process that includes studies of available options and provides a public comment period.

Interface control documents and memorandums of agreement are the principal means of integrating input from diverse organizations into the SNF Management Program.

3.1.2 Memorandums of Agreement

Acceptance of DOE SNF at the repository is based on a memorandum of agreement (MOA) between the Assistant Secretary for Environmental Management (EM) and the Director for OCRWM (RW), Revision 1, dated January 1999. The memorandum states *“Through this MOA, RW and EM seek to achieve safe and timely disposal of DOE SNF and HLW by identifying data needs, interfaces and acceptance criteria and developing compliance procedures needed to support both the geologic repository construction authorization and license application to the NRC and the transportation system necessary to transfer DOE SNF and HLW to an RW facility.”*

A second agreement exists between DOE and the State of Colorado, dated February 13, 1996, regarding shipping spent nuclear fuel out of Colorado. The agreement states *“By this agreement, the Department (of Energy) is committed to shipping the spent nuclear fuel located at the installation (Fort St. Vrain ISFSI) out of Colorado as soon as it can be placed in a geologic repository or interim storage facility, but in any case, by no later than January 1, 2035.”*

A third memorandum of agreement, issued March 27, 2001, between D&D and the SNF Management Program identifies the responsibilities for disposition of CPP-603 wet basins. This memorandum of agreement is titled, *Task and Funding Responsibilities for Deactivation/Decontamination of the CPP-603 Basins at the Idaho Nuclear Technology and Engineering Center.*

A fourth memorandum of agreement between the NSNFP and NE-ID, *Coordination of Quality Assurance Activities and Flow-Down of Technical Requirements Associated with DOE-Owned Spent Nuclear Fuel*, DOE/SNF/MOA-005, Rev. 1, identifies DOE/RW-0333P, *Quality Assurance Requirements and Description*, as contractually delegated to the M&O contractors at each site. The SNF Management Program must comply with DOE/RW-0333P requirements.

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A memorandum of agreement exists between Oak Ridge and the INEEL for receipt of SNF at the INEEL. Other memorandums of agreement will be developed for similar understandings and agreements as the program matures.

3.1.3 Interface Control

Program and project interfaces are defined in the DWPs and LCBs. Technical interfaces are defined in the DWP and project execution plans. Operational interfaces are defined in the management control procedures (MCPs), technical procedures (TPRs), safety analysis reports, and other related documents.

The Level 3 schedules formally document these interfaces. Interface relationships exist in the form of schedule milestones and are tracked to completion within the performance reporting system.

3.2 Performance Requirements

Critical system performance criteria that support mission success are defined in numerous documents. These include the DOE/M&O contract (List B); annual Program Execution Guidance provided by DOE; codes, standards, and regulations (List A); repository requirements documents including the WASRD; and other documentation and accepted recommendations made by oversight organizations such as the Defense Nuclear Facilities Safety Board and the NRC. The sections below discuss these requirements in general terms as they apply to the SNF Management Program. Specific information should be reviewed for current requirements that exist in any one or multiple areas.

3.2.1 Codes, Standards, and Regulations

List A of the M&O contract identifies the codes, standards, and regulations applicable to the M&O contractor. While List A is not all-inclusive, it does represent a cross section of those codes, standards, and regulations applicable to the SNF Management Program.

3.2.2 Safeguards and Security

Company safeguards and security requirements are outlined in Company Manuals 11A, B, C, D, and E. In addition to company and DOE requirements, NRC regulations apply to licensed facilities.

The basic NRC requirements for SNF storage are identified in 10 CFR 60, 72, 73, 74, and 75. In summary, the following requirements are identified:

- Store this type of material only within a protected area (an area with controlled access and physical barriers, such as chain-link fences with barbed wire topping or concrete walls)
- Protect the material by an additional barrier offering penetration resistance, such as an NRC-approved cask or a reactor building
- Grant access to the protected area only to authorized individuals
- Detect and assess unauthorized penetration of, or activities within, the protected area
- Address safeguards criteria, including reporting and documentation requirements

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- Provide the capability for timely communication to a designated response force whenever necessary
- Establish a security organization with written procedures.

Additional safeguards and security requirements are contained in NRC regulations and the INEEL Spent Nuclear Fuel Safeguards & Security Plan (PLN-1238).

3.2.3 Supplier Non-Conformance Reporting

Company procurement requirements are outlined in Company Manual 4. 10 CFR 21 *Reporting of Defects and Noncompliance*, requires that suppliers to NRC-licensed facilities provide information concerning non-conformances in supplied materials that affect systems, structures and components (SSCs). MCP-2928, *10 CFR 21 Evaluations and Reports*, is the implementing document for this process. Procurements that are made for the purposes of obtaining services or materials that affect SSCs must include an annotation in the documentation informing the supplier of its responsibilities under 10 CFR 21.

3.2.4 Quality Assurance

The company's QA program is identified in Company Manual 13A.

The SNF QA Program is based on a variety of requirement documents. Several sources, such as the NRC, OCRWM, and Code of Federal Regulations (CFRs) identify these requirements. Requirements that must be fulfilled for the NRC are contained in operating licenses. Safety analysis reports also describe the ISFSI safety envelopes. Requirements imposed by OCRWM are contained in the Quality Assurance Requirements and Description document, DOE/RW-0333P. The CFRs contain 10 CFR 830 that must be met by DOE M&O contractors. Other CFRs, required through reference in the *Quality Assurance Requirements and Description*, are 10 CFR 50 Appendix B, 10 CFR 60 Subpart G, 10 CFR 71 Subpart H, 10 CFR 72 Subpart G, and 10 CFR 73. Also used in the development of the SNF QA Program are consensus standards such as American Society Mechanical Engineers (ASME) NQA-1 (1989).

Implementation of the INEEL SNF QA Program is based on application of the graded approach. The levels of analysis, documentation, verification, and other controls are applied commensurate with an item's risk and importance. The SNF Management Program's graded approach process is implemented according to MCP-540, *Documenting the Safety Categories of SSCs*, with assigned safety category designations to SNF Management Program items.

Quality program plans for the ISFSIs and balance of non-licensed facilities are identified as follows:

- PLN-466, *Quality Assurance Program Plan for NRC Regulated Facilities*
- PLN-533, *Quality Assurance Program Plan for Non-Licensed Spent Nuclear Fuel Activities*.

These quality program plans contain a matrix of implementing procedures that are used to define and implement SNF related work processes.

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3.2.5 Safety Management

Company safety management requirements are outlined in Company Manuals 14A and B. The ISMS has been implemented for INEEL SNF functional areas as well as for the INEEL site.

The DOE Voluntary Protection Program promotes safety and health excellence through cooperative efforts among labor, management, and government at DOE contractor sites. DOE has also formed partnerships with other federal agencies and the private sector for both advancing and sharing its Voluntary Protection Program experiences and preparing for program challenges in the next century. The safety and health of contractor and federal employees are a high priority for DOE. As part of the Voluntary Protection Program, sites that meet the requirements of outstanding safety and health programs receive STAR recognition, the highest achievement level. The INEEL received STAR status in May 2001. The Voluntary Protection Program information may be accessed at <http://tis.eh.doe.gov/Vpp/>.

3.2.6 Design and Configuration Control and Records Management

Design control and configuration management requirements are outlined in Company Manual 10A.

Procedures governing design control and configuration management processes are identified below:

- MCP-2811, Design Control
- MCP-9185, Technical and Functional Requirements
- MCP-9217, Design Verification
- MCP-3572, System Design Descriptions
- MCP-3630, I & C Computer System Management
- MCP-3039, Analysis Software Control.

The SNF Management Program implements the following critical aspects of configuration management using a graded-approach:

- Design reconstitution, as necessary, so safe and reliable SSCs are used in SNF activities
- Traceable documentation for activities related to SSC design (Conduct of Engineering) and operational activities (Conduct of Operations and Maintenance)
- Change control to maintain consistency with design requirements and the physical/functional configuration of SSCs.

PLN-786, *INEEL Spent Nuclear Fuel Records Management Plan*, and PLN-842, *Configuration Management Plan for INEEL Spent Nuclear Fuel*, identify unique spent nuclear fuel requirements in these functional areas.

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Company records management requirements are outlined in Company Manual 1, MCP-557, *Managing Records*.

Records retention must be determined by record type, identified in writing, and maintained on a controlled schedule of records. Quality records must be classified as lifetime and nonpermanent. For programmatic nonpermanent quality records, the retention period must be at least 3 years. For product nonpermanent quality records the retention period must be at least 10 years. While these retention periods are guidelines, the Records Management Plan will address Criterion 17 of Appendix B to 10 CFR Part 50, DOE/RW-0333P, NQA-1, and DOE orders for records. The overarching principle is that sufficient quality records are maintained to furnish evidence of activities affecting quality.

The Clean/Close INTEC Project identifies a records management coordinator(s) to perform records management functions and activities that satisfy the principles identified above. The records management coordinator(s) must publish the records schedule and maintain the Records Management Plan. In addition, the records management coordinator(s) must perform assessments of the Records Management Program to check that the principles as stated above and in regulatory and guidance documents are being achieved. The Records Management Program is an element of an organization's QA program and is subject to internal audit.

3.2.7 Environment and Health

Company environment and health requirements are outlined in Company Manual 8, PLN-843, *INEEL Spent Nuclear Fuel Program Environment, Safety and Health Plan*, identifies unique ES&H requirements for spent nuclear fuel. For NRC-licensed facilities, NRC regulations apply in addition to company manuals and INEEL program plans.

3.2.8 Radiation Protection

Company radiation protection requirements are outlined in Company Manuals 15A, B, and C. NRC-licensed facilities also have NRC regulations that apply in addition to the company manuals.

3.2.9 Disposition Requirements

Technical performance requirements are specifically defined for INEEL SNF in the current revision of the WASRD. While this document is being refined as the physical and functional characteristics of the repository, and associated handling and storage facilities are being designed, the SNF Management Program continues to assume minimal conditioning, and data requirements will be required for repository disposition.

3.3 Operational Requirements

Company operations requirements are outlined in Company Manual 9. Refer to PDD-1004, *INEEL Integrated Safety Management System*, for a comprehensive flow of work planning to work activity level requirements. For NRC-licensed facilities NRC regulations apply in addition to company manuals.

Conduct of operations as defined in DOE Order 5480.19 and PRD-185, *Conduct of Operations*, is implemented in the INEEL SNF Management Program. The 19 elements of this program are fundamental to the manner in which operations are conducted to comply with DOE requirements.

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3.3.1 System/Site Performance Objectives

Performance objectives for the SNF Management Program are derived from the mission statement, and goals and objectives, and include the following work scope objectives:

- Eliminate vulnerabilities and provide safe interim storage
- Consolidate SNF
- Move wet-stored SNF to dry storage
- Prepare SNF for repository disposition.

The M&O contractor manages the SNF Management Program in accordance with the project management philosophy embodied in DOE O 413.3 in conformance with quality, safety, and safeguards and security requirements.

The primary objective of the SNF Management Program is to provide technically sound, timely, cost-effective planning and execution of the program, in conformance with quality and safety requirements. In addition, the project management systems must provide added value to the program and projects in tracking and trending schedule and cost variances.

An important objective of the project management system is to provide integration of the work scope, schedule, and cost baselines while providing performance measures to enable program objectives to be executed as planned. Integration is achieved by meeting planned work scope within schedule and cost baselines.

Performance objectives include safety of the worker, public, and environment as the top priority in the INEEL SNF Management Program. The ICP has measures to reduce these ES&H risks, including the proactive step by the DOE to license new facilities with the NRC. The TMI-2 Storage Facility (CPP-1774) at INTEC was the first DOE-constructed/M&O-operated NRC-licensed facility in the DOE complex. This represents a step in the future direction for facilities at DOE. The Fort St. Vrain facility in Platteville, Colorado, was transferred to NE-ID from Public Service of Colorado, and the NRC license was transferred in the process. In addition, NE-ID has mandated the use of DOE/RW-0333P as the QA standard for INEEL SNF work. Because this is the QA standard used by the repository, SNF Management Program activities are synchronized with the standard used for ultimate SNF disposition.

To support compliance with the repository requirements for acceptance of SNF from the INEEL, a compliance plan has been developed for each fuel that identifies the steps necessary to achieve repository acceptance and will be updated periodically. The WASRD identifies the requirements for repository acceptance. While the WASRD continues to evolve, the SNF Management Program implements the requirements through the compliance plan.

Project execution plans identify the steps required to meet the repository requirements in the WASRD. The following repository-related activities that develop and provide repository-related information are:

- Activities that affect traceability of existing data to onsite containers
- Activities that affect fuel record retrieval

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- Activities that create new SNF data
- Activities that confirm existing SNF data
- Activities that modify the fuel configuration (cutting long fuel assemblies to fit canisters, disassembling fuel assemblies, etc.)
- Activities related to items or components that control the fuel configuration during offsite shipment to the repository or repository handling
- Final dewatering or drying activities
- Activities related to the design, procurement, fabrication, or installation of criticality controls
- Activities related to the design, procurement, or fabrication of items important to safety on the repository Q-list to be turned over to or used by the repository
- Activities related to services provided to the repository
- Activities related to deployment of technologies.

3.3.2 Facility Disposition Program

Guidance to the SNF Management Program includes the following activities.

- NRC-licensed facilities require development of a D&D plan and approval by the NRC prior to closure of a facility.
- SNF facility managers must include in their work scope, cost, and schedule baselines sufficient activities for turnover of the facility to the D&D organization.
- SNF facility plans must include formal memorandums of agreement with the D&D organization.
- Upon successful turnover of the facility to D&D, SNF Management Program responsibilities for the facility will cease.
- The D&D program will oversee and manage D&D activities of SNF facilities.
- INTEC strategic plan identifies proposed turnover dates of SNF facilities to the D&D program.
- MCP-2860, *Building/Facility Turnover*, will be followed to complete the turnover.

3.3.3 Project Closeout and Transition

General guidance for project closeout and transition is identified below.

- The year following removal of last fuel will be used for project closeout activities and transition of facility to the D&D Program.

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- MCP-2860, *Building/Facility Turnover*, will be followed to complete this transition.
- While the facility is in the D&D stage, SNF personnel may be used to perform some surveillance, monitoring, and maintenance functions with funding provided by D&D.

Company closure management requirements are outlined in Company Manual 18. Procedures governing the closeout process are identified below:

- Company Manual 2, *Logistics & Property Management*
- PRD-4, *INEEL Project Management System Requirements*
- MCP-135, *Creating, Modifying, and Canceling Procedures and Other DMCS-Controlled Documents*
- MCP-3056, *Test Control*
- MCP-538, *Control of Non-Conforming Items*
- MCP-2377, *Development, Assessment and Maintenance of Drawings*
- MCP-9106, *Management of INEEL Projects*
- MCP-2783, *Startup and Restart of Nuclear Facilities*
- MCP-6402, *Master Equipment List and Maintenance History*
- MCP-2874, *Davis-Bacon Applicability Review Process*
- MCP-2811, *Design Control*
- MCP-2863, *Construction Work Coordination and Hazard Control*
- MCP-3572, *System Design Descriptions*
- GDE-51, *Construction Project Management Guide*
- STD-9, *Standard for Technical Procedure Writing*
- MCP-2869, *Project Turnover and Acceptance*
- MCP-2755, *Nuclear Material Gains, Losses and Adjustments*
- MCP-2757, *Terminating Nuclear Material Safeguards Controls.*

Activities performed as part of SNF activities in preparation for facility disposition are subject to assessment by CERCLA agencies (EPA, IDEQ, and DOE) for impact to the cumulative risk to human health and the environment per the OU 3-13 Record of Decision (DOE/ID-10660) and the Operable Unit 3-13 Group 2 Closure Evaluation Criteria and Checklist (DOE/ID-10775).

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3.4 Project Execution Plans

A project execution plan (PEP) will be developed for the Idaho Completion Project. The Clean/Close INTEC PEP will document exceptions to the Idaho Completion Project PEP. The subproject PEPs will document exceptions to the Clean/Close INTEC PEP.

3.5 Resource Requirements

Annual planning, which includes resource-loaded schedules and resource leveling, identifies the resource requirements for the SNF Management Program. The LCB supports the development of long-term resource requirements.

Subprojects must plan their resource requirements after determining that interfacing functions/organizations such as Packaging & Transportation, Construction, Health Physics, Operations, Maintenance, Engineering, Infrastructure, and Technology Development are able to provide resources according to plans.

3.5.1 Personnel Training and Qualifications

SNF Management Program personnel must have a current Employee Position Description, verified evidence of education and experience for applicable positions, and documented indoctrination and training tailored for the work the employee is performing, per requirements found in PRD-5072, *Personnel Training and Qualification*.

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4. RISK MANAGEMENT

Risk is defined as a quantifiable expression of the probability and consequences that an event will prevent the project from meeting its defined project baseline. Risk includes a variety of categories, such as technology, schedule, budget, safety, and regulatory.

Risk management includes risk analysis and is used throughout the project to identify risk factors. The risks are prioritized high, medium, or low and mitigated via project management control methods and risk mitigation techniques. Sound program and project management principles and practices as described in the following sections are used to mitigate low and most medium risks. High risks require additional steps including specific risk management planning and are integrated with the ongoing management and execution planning.

Risks are not always identified during the normal course of planning. A process to capture risks during project execution uses the issues management process for issues that have impact beyond an individual project or service. In general, the focus is on resolving conflicts or discontinuities, omissions in the program baselines, interface compatibility problems, and conflicts in requirement and planning assumptions. The issue identification and resolution process is used to transform planning assumptions with major impacts into defined requirements. A limited, select number of technical issues that are not crosscutting may be reported in monthly status reports. Typically, subordinate risks and issues will be identified and managed by the individual subprojects, as necessary. Issues that cannot be resolved at the subproject level are elevated to Clean/Close INTEC Project management for resolution.

As INEEL SNF data are developed and analyzed by the SNF Management Program participants, potential issues for resolution may be identified. These may include issues impacting multiple subprojects or single subproject issues. When identified, the extent and potential severity of consequences raised by the issue and crosscutting areas impacted are defined. Clean/Close INTEC Project management will determine if the issue should be included in the Trend Tracking system.

SNF Management Program subproject managers assign qualified personnel to evaluate issues and propose resolutions.

Planning & Controls maintains the Trend Report as an administratively controlled document. It is updated as additions, changes, or completed resolutions occur. Monthly, it is sent to Clean/Close INTEC Project management with changes or delinquencies noted. Completed resolutions are carried on the report until any required change control process is completed.

4.1 Performance Indicators

Progress is reported for on-going SNF Management Program activities as described in Section 1.6.

4.2 Process Control Methods and Requirements

Process control methods are prescribed by technical procedures for those activities requiring continuous monitoring at INEEL SNF facilities. Criticality and radiological controls are the areas most often associated with technical procedures. However, other controls to provide negative or positive pressure boundaries, control water temperature, chemistry, or level are used at the INEEL. The safety

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analysis reports identify the hazards and the procedural or equipment controls necessary for safe operation.

4.3 Management and Independent Assessments

Management and independent assessments are conducted to determine the adequacy, effectiveness, and level of implementation of the QA program and identify obstacles to meeting objectives. Management assessments include QA program verifications that are conducted by management outside of those conducted by the QA organization to evaluate the scope, status, adequacy, programmatic compliance, and implementation effectiveness of the QA program. The NSNFP on behalf of DOE conducts independent assessments. Self-assessments are conducted in accordance with MCP-8, *Self-Assessment Process for Continuous Improvement*.

Activities that develop and provide the following repository-related information must be specifically addressed by management and independent assessments where applicable:

- Activities that affect traceability of existing data to onsite containers
- Activities that affect fuel record retrieval
- Activities that create new SNF data
- Activities that confirm existing SNF data
- Activities that modify the fuel configuration (cutting long fuel assemblies to fit canisters, disassembling fuel assemblies, etc.)
- Activities related to items or components that control the fuel configuration during offsite shipment to the repository or repository handling
- Final dewatering or drying activities
- Activities related to the design, procurement, fabrication, or installation of criticality controls
- Activities related to the design, procurement, or fabrication of items important to safety on the repository Q-list to be turned over to or used by the repository
- Activities related to services provided to the repository
- Activities related to deployment of technologies.

DOE and the M&O contractor at the INEEL conduct internal and external audits in areas where reasonable cause indicates a need to review practices usually in association with performance or safety issues.

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4.4 Corrective Action

The identification, documentation, tracking, trending, and resolution of conditions adverse to quality are the cornerstone of any quality improvement effort within a QA program. MCP-598, *Corrective Action System*, is the implementing procedure for the SNF Management Program that governs the documentation and resolution of conditions adverse to quality. This procedure defines conditions adverse to quality and significant conditions adverse to quality. MCP-598 contains the steps taken to develop a corrective action plan that is responsive to the specific deficiencies identified in the condition adverse to quality. Also contained in this procedure are the steps necessary for corrective action verification and closeout.

4.4.1 Corrective Action Plan Format and Content

MCP-598, *Corrective Action System*, is the established procedure for handling corrective actions within the SNF Management Program.

Instructions in the referenced procedure are specified for SNF related deficiencies. A DOE/RW-0333P-certified quality engineer must concur with the corrective action plan and any revisions. In addition, the ICARE (Issue Communication and Resolution Environment) System will automatically notify NE-ID at each major process step in the deficiency identification, screening, and resolution process.

4.4.2 Corrective Action Validation and Closeout

MCP-598, *Corrective Action System*, is the established procedure for handling corrective actions within the SNF Management Program. A DOE/RW-0333P- certified quality engineer will concur with corrective action plans and verify completion of corrective actions.

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Appendix A

Existing and Future SNF Activities

Existing and future activities—fiscal year schedule.

			Activity Status (E=Existing, C=Completed)
Title	Finish Date	Comments	
WFO - Spent Fuel Storage Fees		NRC NPRA6893	E
WFO - EPRI—Dry Cask Storage Supts		NRC NPRO6264	E
WFO - Dry Cask Storage Characterization		NRC NPRO6038	C
WFO - Defense Threat Reduction Agency		DOD NRT33945	E
WFO - B&W—Engineering & Technical Services		B&W WPR88G902	E
WFO - BPNL—FSU Joint Action Team		Battelle Pacific Northwest Lab WPR880910	E
WFO - GPU—Abnormal Waste-ID		GPU WPR888607	E
WFO - West Valley Fuel Shipments	2003	DOE-WV DRTOH9901 and DRTOH9804	C
Domestic Reactor Receipts	2027		
Universities (16)			
Cornell	2004		E
Penn State	2016		
	2027		
Arizona	2011		
Texas	2005		
	2027		
Kansas State	2012		
	2021		
Reed College	2008		
	2027		
UC Davis	2006		
	2027		
UC Irvine	2020		
Utah	2010		
	2025		
North Carolina State	2008		
	2019		
State University of NY-Buffalo	2004		
Illinois	2004		

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Title	Finish Date	Comments	Activity Status (E=Existing, C=Completed)
Wisconsin	2011 2022		
Oregon State	2008 2027		
Texas A&M	2010 2027		
Maryland	2027		
Washington State	2014 2023		
DOE Receipts			
ANL-W	2012-2014		
ANL-E	2005		
Oak Ridge	2003		E
West Valley	2003		C
Sandia National Laboratory	2004-2007 2018		
Non-DOE Site Receipts			
Aerotest	2027		
DOW	2027		
USGS	2027		
AFRRI	2022		
General Atomics	2003 2012	RERTR & HTGR Other	E
B&W, NESI	2021		
Foreign Research Reactor Receipts	1998 - 2009	Two per year planned through 2009	
Japan (Rikkyo)	2003		E
CPP-603 Pools			
FECF Peach Bottom to IFSF	2003 - 2004		E
CPP-603 IFSF Receipts and Shipments			
MTR Receipts	2002		C
PBF Receipts	2003 - 2004		E
Oak Ridge Receipts	2003 - 2004		E

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Title	Finish Date	Comments	Activity Status (E=Existing, C=Completed)
ATR from TRA	2006-2010		E
ANL-W Receipts	2012-2014		
CPP-666 SNF to Dry Storage	2004-2012		
TRIGA/Peach Bottom to SNFDSP	2006-2009		
Other DOE SNF to SNFDSP	2010-2027		
CPP-666 Receipts and Shipments			
Navy to ECF	2007-2012		
ATR from TRA	2002-2005		E
EBR-II to ANL-W	2007-2011		
Fermi Driver to IFSF	2006-2007		
Other DOE SNF to IFSF	2007-2012		
CPP-749 Receipts and Shipments			
Oak Ridge Receipts	2003 – 2004		E
Fermi Blanket to treatment	2013-2018		
Peach Bottom/LWBR to SNFDSP	2005-2008		
CPP-1774 Receipts and Shipments			
TMI-2 Fuel Debris to SNFDSP	2024-2028		
TAN Shipments			
LOFT/Commercial to TAN-791	2002		C
LOFT/Commercial to INTEC Pad	2004		E
Fort St. Vrain Shipments			
Fort St. Vrain Shipments to SNFDSP	2019-2022	From Platteville, Colorado	
SNFDSP Receipts			
TRIGA/Peach Bottom from IFSF	2006-2009		
Peach Bottom/LWBR from CPP-749	2005-2008		
West Valley/LOFT/Commercial from INTEC Pad	2011-2012		
TMI-2 Fuel Debris from CPP-1774	2024-2028		
Other DOE SNF from IFSF	2010-2027		
Fort St.Vrain Receipts from Colorado	2019-2022		
DRR Receipts from Domestic Shippers	2022-2027		

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			Activity Status (E=Existing, C=Completed)
Title	Finish Date	Comments	
Fermi Blanket Sodium Bonded Treatment	2013-2018	Undetermined Treatment	
LOFT/Commercial LICP	2002		C
Miscellaneous Projects			
INTEC Pad for West Valley SNF Casks	2004		E
IFSF HVAC Upgrade Project	2004		E